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(54) VARIABLE CAPACITANCE ELEMENT

such as a surface electrode, etc., is not enlarged, the maximum readout capacitance can be taken large.

(57) Abstract:

PURPOSE: To improve the extension of a depletion layer into an element region thereby enabling the maximum readout capacitance to be taken large even if the shape of an electrode such as a surface electrode, etc., is not enlarged and the occupancy area of an element to be decreased by forming an element region in the shape of an inverted triangle for cross section, and forming a buried electrode at the slant of its inverted triangle.

CONSTITUTION: Grooves 4 and 5, whose cross sections are rhombic, are made a specified interval apart by etching at the main face of a semiconductor substrate 3, and by these two grooves 4 and 5, an element region 6 whose cross section is an inverted triangle is made. And at the surface of the element region 6, the surface electrode 8 as a capacitance readout electrode is made through an oxide film 7, and MOS-type structure is made of these oxide film 7, surface electrode 8 and rear electrode 9. Moreover, inside both grooves 4 and 5 are made silicon oxide films 11, and further inside them are made buried electrodes 12 as bias application electrodes consisting of P⁺ polysilicon. By this constitution, the extension of a depletion layer into the element region becomes good, and even if the shape of an electrode

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